

REMARKS

This paper is responsive to an Office Action dated October 30, 2003. Claims 20-31 were previously withdrawn in response to an election requirement. Therefore, prior to this amendment, claims 1-19 were pending. After amending claims 1, 2, 4-6, 11, 12, 14, 16, and 18, claims 1-19 remain pending.

In Section 2 of the Office Action claims 1, 2, 4, 11, 12, and 14 have been objected to because of informalities involving the recitation of the first and second rigid support structures. In response, the claims 1, 2, 4-6, 11, 12, and 14 have been amended to more clearly describe the claimed invention rigid substrates.

Section 3 of the Office Action states that claims 6, 7, 16, and 17 have been rejected under 35 U.S.C. 112, second paragraph, as indefinite for use of the phrase "ambient pressure". In response, the Applicant notes that "ambient pressure" has been defined in the specification (page 12, ln. 12) as being approximately 1 atmosphere. This definition of ambient pressure would enable one skilled in the art to practice the invention.

In Section 5 of the Office Action, claims 1-5, 8 and 9 have been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ippel et al. ("Ippel"; US Pub. 2002/0031622) in view of Wu et al. ("Wu"; US Patent 6,545,410) and Izumi et al. ("Izumi"; US Patent 6,104,457). The Office Action states that Ippel discloses a first rigid substrate and first flexible substrate, but acknowledges that first rigid substrate trenches are not described. The Office Action states that Wu describes a second

support substrate and second flexible substrate. The Office Action states that Izumi discloses the injection of adhesive in a vacuum environment, and contends that it would have been obvious to incorporate the teachings of Wu and Izumi, with Ippel. This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaack* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

Generally, Ippel is concerned with forming a touchscreen [0002]. Ippel describes spacers (30a or 30b) that are used to separate flexible transparent conductive films 20 and 50 [0021-0022]. When flexible films 20 and 50 are pushed together (touched), an electrical connection is completed [0005]. The spacers prevent contact between films 20 and 50, until flexed by a user. Ippel states that the flexible ITO film 50 is formed on the support substrate 40 using a physical vapor deposition (PVD) process [0021]. The deposition of ITO using PVD is a conventional process. Ippel does not use an adhesive to seal the support (rigid) substrate to the flexible substrate, and does not form trenches in the support substrate to support an adhesion process.

On the other hand, Izumi and Wu address the problem of creating a seal between rigid substrates. Izumi describes a sealing material 13 that is located between a reinforcing substrate 3 and a liquid crystal panel 2 (col. 10, ln. 11-18, see Fig. 1b). A liquid crystal panel 2 is described as consisting of a TFT substrate 4 and a glass substrate 5 (col. 7, ln. 19-20). Izumi uses sealing material 13 to form a space between a reinforcing substrate and a rigid panel, and applies a positive pressure to inject an adhesive (col. 10, ln. 32-36). Izumi does not form trenches in the support (rigid) substrate, and he does not attach a flexible substrate to a rigid substrate.

Wu is concerned with attaching a front substrate 32 to a rear substrate to enclose a display area 40 (col. 3, ln. 21-26). Wu describes the use of a plurality of barrier ribs to form a sealing channel that is filled by a sealing frit. The invention eliminates a heating process that temporarily sinters the sealing frit, causing damage the sealing frit (col. 2, ln. 9-33). Figs 6 and 7 describe grooves 54 are cut into the barrier ribs 44/46 to increase the effective sealing area (col. 3, ln. 48-58). That is, Wu describes a sealing channel 48 connected by grooves 54, filled by the sealing frit (col. 3, ln. 54-57). The grooves are cut into the ribs 44/46, and not in the substrate 32 or 34. A sealing frit is a low-melting temperature glass (col. 1, ln. 44-45). In one embodiment, Wu forms a joint notch 52 in a dielectric material 38 attached to the front substrate 32, to seat the ribs 44/46 (col. 3, ln. 36-47). Thus, Wu does not describe a process to uses an adhesive to bond. Wu does not describe a trench formed in a rigid substrate. As with Izumi, Wu forms a structure (ribs 44/46 and a frit-filled sealing channel 48) between rigid substrates (32 and 34) to be

bonded. Neither does Wu describe a process that bonds a flexible substrate to a rigid substrate.

In accordance with the above-stated first *prima facie* requirement, the references themselves must suggest a reason to either modify a reference, or the knowledge generally must provide a motivation to modify the reference in such a way as to make the claimed invention obvious. However, there is no motivation to combine the three above-mentioned references for the purpose of obviousness analysis. "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980), see MPEP 2144.06.

In this case, Ippel is solving a problem associated with the fabrication of touchscreens, and it would not be obvious to combine Ippel with references that are attempting to solve rigid substrate-bonding issues. That is, Ippel should not be combined with Wu/Izumi. Further, the claimed invention addresses a problem with bonding a flexible substrate to a rigid substrate. Wu and Izumi are concerned with the bonding of rigid substrates. There is no suggestion to combine references that are bonding rigid substrates, to make obvious an invention that bonds a flexible substrate to a rigid substrate. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Further, the Office Action has not demonstrated that the modification of the cited the prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis. That is, even when combined, the three prior art references do not point to a process that bonds a rigid substrate to a flexible substrate by forming an adhesive-filled trench in the rigid substrate.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. However, even if there was a suggestion to combine the references, the combination does not disclose all the elements of claim 1. The invention of claim 1 recites processes that form a trench in a rigid substrate, and fill the rigid substrates trenched with adhesive. None of the references disclose these steps. The Office Action, in the second paragraph of page 5, acknowledges that the combination of these three references do not "disclose the steps of forming said support substrate with trenches." The invention of claim 1 also recites a product that is a flexible substrate attached to a rigid substrate. Again, none of the references describe this product. Claims 2-5 and 8-9, dependent from claim 1, enjoy the same distinctions from the cited prior art. Since the prior art references neither explicitly describe all the elements of the claimed invention, nor suggest a modification that makes the claimed invention obvious, the Examiner is requested to withdraw the rejection.

In Section 6 of the Office Action claims 6 and 7 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ippel, in view of Wu, Izumi, and Pai et al. ("Pai"; US Patent 6,612,888). The Office

Action acknowledges that the first 3 references do not disclose a trench with a mouth, but that Pai discloses a trench and the use of a vacuum to distribute adhesive. The Office Action further states that it would have been obvious to combine the references. This rejection is traversed as follows.

Generally, Pai describes a process of sealing an electro-luminescence device 502 between a glass substrate 500 and a glass plate 504. Initially, each luminescence device 502 is formed on glass substrate 500, partially surrounded by frame glue 508 and a spacer 510, and covered with glass plate 504 (col. 4, ln. 23-36). An opening 512 in the glue/spacer 508/510 permits a cavity 518 to be formed between glass layers 500/504. The glass substrate is cut, to separate the discrete luminescence devices from each other (col. 4, ln. 54-64). After pulling a vacuum, each package is inserted into a glue tub 522 and the cavity 518 is filled (col. 5, ln. 1-16). The Applicant respectfully notes that cavity 518 is not a trench formed in a glass substrate, but rather, a space between glass substrates separated by a spacer.

There is no motivation to combine the Pai reference with the primary reference, Ippel, for the purpose of an obviousness analysis. Ippel is concerned with forming a touchscreen, Pai forms a different product using a different process. Neither is there a suggestion to apply the Pai reference to the claimed invention. The claimed invention is concerned with forming a seal between a rigid substrate and a flexible substrate, while Pai forms a seal between 2 glass (rigid) substrates.

Again, there is no demonstration that the modification of the cited the prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the

obviousness analysis. The four prior art references combined do not point to a process that bonds a rigid substrate to a flexible substrate by forming a trench in the rigid substrate, and filling the trench with adhesive.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. However, even if there was a suggestion to combine the references, the combination does not disclose all the elements of claim 1. The invention of claim 1 recites processes of forming a trench in the rigid substrate, and filling the rigid substrate trenches with adhesive. None of the references disclose these steps. The invention of claim 1 recites a product that is a flexible substrate that is adhered with adhesive to a rigid substrate. Again, none of the references describe this product. Claims 6 and 7, dependent from claim 1, enjoy the same distinctions from the cited prior art. Since the prior art references neither explicitly describe all the elements of the claimed invention, nor suggest a modification that makes the claimed invention obvious, the Examiner is requested to withdraw the rejection.

In Section 7 of the Office Action, claim 10 has been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ippel, in view of Wu and Izumi, and further in view of Matsui (US Patent 6,191,007). The Office Action acknowledges that the first three references fail to describe the steps of forming a support substrate with trenches, but states that Matsui, in Fig. 107 and in the text at col. 25, ln. 19-31, describes such a process, and that it would have been obvious to incorporate the teachings of Matsui. This rejection is traversed as follows.

Matsui describes a process of forming a monocrystalline silicon thin film on an SOI substrate (col. 25, ln. 11-13). There is no

motivation to combine the Matsui reference with the primary reference, Ippel, for the purpose of an obviousness analysis. Ippel is concerned with forming a touchscreen, Matsui is concerned with forming a semiconductor layer on a support substrate with an intervening insulator, to increase the uniformity of the semiconductor layer thickness (Abstract). Ippel and Matsui are solving different problems. Neither is there a suggestion to apply the Matsui reference to the claimed invention. The claimed invention is concerned with forming a seal between a rigid substrate and a flexible substrate, while Matsui forms an insulator between a semiconductor layer and a substrate.

Again, there is no demonstration that the modification of the cited the prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis. The four prior art references combined do not point to a process that bonds a rigid substrate to a flexible substrate by forming a trench in the rigid substrate, and filling the trench with adhesive.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. However, even if there was a suggestion to combine the references, the combination does not disclose all the elements of claim 1. The invention of claim 1 recites processes of forming a trench in the rigid substrate, and filling the rigid substrate trenches with adhesive. None of the references disclose these steps. The invention of claim 1 recites a product that is a flexible substrate that is adhered with adhesive to a rigid substrate. Again, none of the references describe this product. Claim 10, dependent from claim 1, enjoys the same distinctions from the cited prior art. Since the prior art references neither

explicitly describe all the elements of the claimed invention, nor suggest a modification that makes the claimed invention obvious, the Examiner is requested to withdraw the rejection.

In Section 8 of the Office Action claims 11-15 and 18-19 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ippel, Wu, and Izumi. The Office Action states that Ippel uses spacers between substrates, that Wu discloses spacer channels, and that Izumi uses a vacuum environment. The Office Action states that it would have been obvious to combine the references. This rejection is traversed as follows.

The three prior art references have been described above in response to the rejection of claim 1. With respect to the first *prima facie* requirement, there is no more motivation to combine references for analysis of claim 11 than there is for claim 1. As above, Ippel solves a problem associated with the use of touchscreens, whereas Wu and Izumi are solving substrate-bonding issues. Therefore, the 3 prior art references should not be combined for any kind of obviousness analysis. Claim 11 (like claim 1) addresses a problem with bonding a flexible substrate to a rigid substrate. Wu and Izumi are only concerned with the bonding of rigid substrates. Again, there is no suggestion to combine references that are bonding rigid substrates, to make obvious the bonding of a rigid substrate to a flexible substrate.

Neither has the Office Action demonstrated that the modification of the cited the prior art reference points to the reasonable expectation of success in the present invention, the second *prima facie* obviousness requirement. The combined references do not point to any kind of process that bonds a rigid substrate to a flexible substrate.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. However, even if there was a suggestion to combine the references, the combination does not disclose all the elements of claim 11. Ippel does not form a pattern of spacers with spacers channels between spacers. Rather, Ippel forms spacer dots between flexible substrates.

Wu forms a series of barrier ribs 44/46 between substrates, with grooves formed in the ribs. A plan view of a cross-hatched type pattern, with communication between the channels is shown in Fig. 8. To more clearly differentiate the claimed invention from Wu, claim 11 has been amended to recite a pattern of spacers "consisting of non-communicating" spacer channels between the spacers. The "consisting of" language is intended to state that *only* spacer channels can be formed between the spacers, and further incorporates the limitation that no structures (such as grooves) be formed between the spacers that permit intercommunication between the spacer channels. None of the references describe a process of forming a pattern of spacers consisting of (only) spacer channels between the spacers. The invention of claim 11 recites a product that is a flexible substrate adhered to a rigid substrate. Regardless of the spacer and spacer channel elements, none of the references describe this product. Claims 12-15 and 18-19, dependent from claim 11, enjoy the same distinctions from the cited prior art. Since the prior art references neither explicitly describe all the elements of the claimed invention, nor suggest a modification that makes the claimed invention obvious, the Examiner is requested to withdraw the rejection.

In Section 9 of the Office Action claims 16 and 17 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ippel, in view of Wu, Izumi, and Pai. The Office Action acknowledges that the first 3 references do not disclose a trench with a mouth, but that Pai discloses a trench and the use of a vacuum to distribute adhesive. The Office Action further states that it would have been obvious to combine the references. This rejection is traversed as follows.

To reiterate, Pai initially forms a cavity between glass substrates using a "C"-shaped spacer. The cavity is subsequently filled. There is no motivation to combine the Pai reference with the primary reference, Ippel, for the purpose of an obviousness analysis. Ippel is concerned with forming a touchscreen, Pai forms a different product using a different process. Neither is there a suggestion to apply the Pai reference to the claimed invention. The claimed invention is concerned with forming a seal between a rigid substrate and a flexible substrate, while Pai forms a seal between 2 glass (rigid) substrates.

Again, it has not been demonstrated that the modification of the cited the prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis. The four prior art references combined do not point to a process that bonds a rigid substrate to a flexible substrate.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. However, even if there was a suggestion to combine the references, the combination does not disclose all the elements of claim 11. The combination of references does not describe a process of forming a pattern of spacers "consisting of non-

communicating" spacer channels between the spacers. The invention of claim 11 recites a product that is a flexible substrate adhered to a rigid substrate. Again, none of the references describe this product. Claims 16 and 17, dependent from claim 11, enjoy the same distinctions from the cited prior art. Since the prior art references neither explicitly describe all the elements of the claimed invention, nor suggest a modification that makes the claimed invention obvious, the Examiner is requested to withdraw the rejection.

It is believed that the application is in condition for allowance and reconsideration is earnestly solicited.

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Respectfully submitted,

David Ripma

Registration No. 27,672

David Ripma, Patent Counsel
Sharp Laboratories of America, Inc.
5750 NW Pacific Rim Blvd.
Camas, WA 98607
Telephone: (360) 834-8754
Facsimile: (360) 817-8505
dripma@sharplabs.com